eyeheight

AD-2/AD-2E

audio description monitoring units

user manual

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1 System Overview

This manual describes the function of the AD-2 and AD-2E units. The AD-2 monitors AES audio description data, and decodes both PAN and FADE and AUDIO LEVEL information. The AD-2E has the same functionality but works on embedded audio. The modules flag suitable alarms and display the information in vision overlaid onto the video screen. All the modules are fully compatible with the eyesight monitoring system. A GPI/Alarm option is available for both the AD-2 and the AD-2E. Alarm relay closures which can be cleared by externally provided GPI switching are also included.

- The AD-2 monitors AES audio description data, the AD-2E monitors embedded audio description data.
- The AD-2/AD-2E provides a monitoring mix output of combined programme audio and audio description as decoded. A re-clocked AD output is also provided.
- Groups 1 & 2 of the output video will always be the original program audio.
- The AD-2E has the facility to embed the ‘mixed’ programme with audio description or original audio description into audio groups 3 & 4 of the output video. This will only happen when the audio description control track is valid (status = OK).
- Displays status of audio description level (PPM bar graph), fade information, (vertical bar graph) and pan information, (horizontal bar graph), on screen.
- A status text banner is also overlayed on the screen showing absent, OK, Swapped, Inverted and Swapped and Inverted. Where “Absent” indicates no audio description control data, “Swapped” indicates the control data on the left channel. “OK”, “Inverted”, and “Swapped and inverted” being self-evident. In addition to these messages if a CRC error occurs the unit will also display, “CRC er”, “Sw CRC”, “InvCRC” and “S+ICRC” to indicate both the CRC error and the audio status.
- The user can define a 6 digit channel Ident, definable in foreground colour, background colour, flashing or normal mode.
- The unit provides physical relay closures to give “hardware” outputs of the alarms and inputs GPI’s to reset the alarms.
- All messages can be user defined, in foreground colour, background colour, flashing or normal mode and whether that condition triggers an alarm.
- The main “alert” alarms can be “accepted” by the operator setting a second “indication” alarm, which is cleared when the problem is completely resolved.
- The module broadcasts information compatible with the MD-2 Master Display module, enabling collation of any unit’s displays and allowing for remote supervision.

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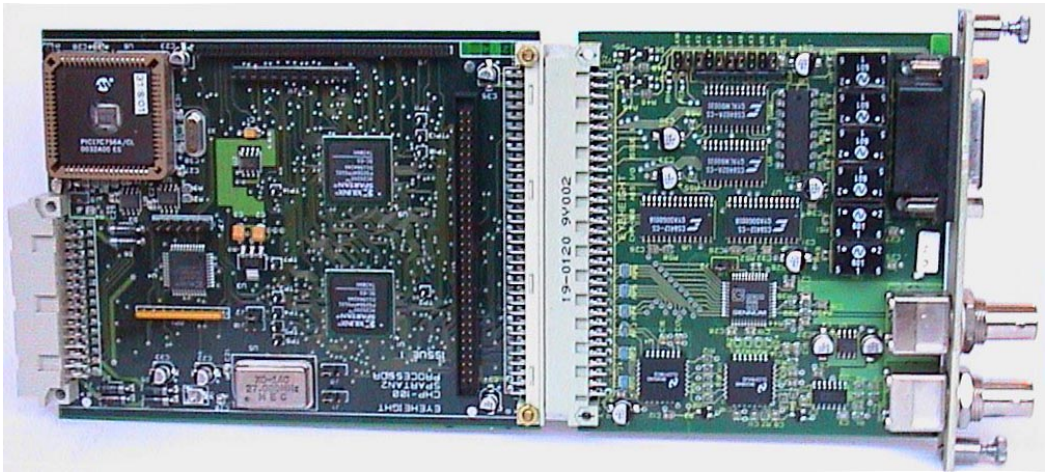

Figure 1 The AD-2/AD2E audio description module.

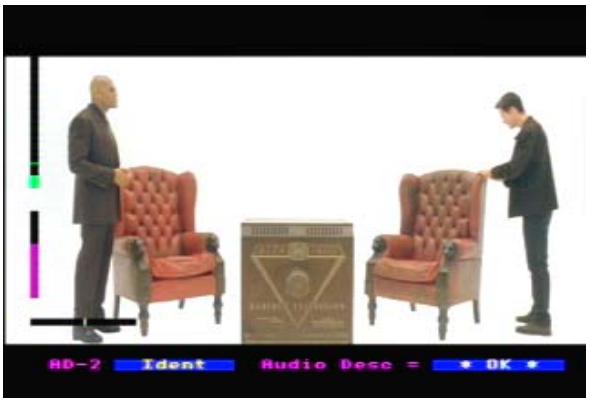

Figure 2 On-screen display of the AD-2/AD-2E

1.1 Associated Equipment for the AD-2/AD-2E

The AD-2/AD-2E is a module and requires both a chassis and a control surface to function.

1.1.1 Chassis Types

- **flexiBox** is a 1RU chassis. The order code is FB-9. This will hold a maximum of three AD-2/AD-2E modules with “Hot Swap” redundant PSU option and “Hot Swap” AD-2/AD-2E modules.
- **maxiBox** is an alternative low cost 1RU chassis. The order code is MX-9. This also will hold a maximum of three AD-2/AD-2E modules but it has no redundant PSU option and the AD units must be factory fitted.

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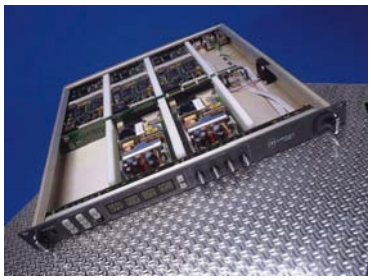

Figure 3 FlexiBox with flexiPanel fitted

1.1.2 Control Surfaces

- **flexiPanel** is a IRU control surface that fits on the Front of a 1RU flexiBox. The order code is FP-9. A FlexiPanel can also be used in conjunction with a miniBox, in this case the extra accessory (Order code RR-9) will be required
- **FP-10** is a desk mounting control surface (Order code FP-10). This unit is a modular unit which can be used in conjunction with the units below.

Figure 4 Desktop modular panel FP-10

Figure 5 1RU panel FP-9

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2 Installation

2.1 Installation of the AD-2/AD-2E product

If this unit is already pre-installed in a flexiBox (FB-9), or a maxiBox, with either a local or a remote panel from the factory then refer to the "Hardware Installation Guide" which will be enclosed with the system. If this unit is pre-installed in a miniBox (MB-9), then also refer to the "Hardware Installation Guide" which will be enclosed with the system

If this unit has been ordered separately, we assume here that you already have a flexiBox system with a Flexipanel and that the flexiBox has at least two spare slots for an AD-2/AD-2E card.

2.2 Installing the AD-2/AD-2E into a flexiBox

To install the AD-2/AD-2E into a flexiBox it is desirable (but not necessary) to power down the flexiBox. Follow these instructions.

On the rear of the flexiBox are 6 slots for Products. Remove any pair of spare blanking plates one above another. There are 2 off M2.5 Screws, which require unfastening for each blanking plate.

Slide the Product PCB into the spare slots and firmly push it "home".

Use the four thumbscrews to fasten the unit in place. Take care that the ribbon cable for the upper circuit board stays attached to the lower board.

Now refer to the "GeNETics User Guide". If your system consists of a single flexiBox with a single flexiPanel then refer to the section titled "flexiPanel Auto Set-up". If your system is part of a network with more than one flexiPanel then refer to the section titled "flexiPanel Manual Set-up". This will guide you through acquiring your product as a device on the flexiPanel.

2.3 Connecting to an AD-2/AD-2E

Connections for the AD-2/AD-2E are shown below. For an AD-2E all the audio information, programme and audio description, is on the embedded audio feed. Programme material is on channels 1-2 and the audio description is assumed to be on audio 3-4. The AES monitoring outputs on the AD-2E are 48K but not clock synchronous to the incoming video feeds

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PGM Video

PGM Video+ on screen display

Pin Number	Function
1	AES 1 Program Input+
2	AES 1 Program Input-
3	AES 2 Audio Desc Input+
4	AES 2 Audio Desc Input-
5	AES 1a AD monitor mix+
6	AES 1a AD monitor mix-
7	AES 1b AD monitor mix+
8	AES 1b AD monitor mix-
9	AES 2a AD reclock output+
10	AES 2a AD reclock output-
11	AES 2b AD reclock output+
12	AES 2b AD reclock output-
13	Not used
14	Not used
15	GND

Figure 6 AD-2 Rear connections

PGM Video

+Emb Aud on 1/2

+Aud Desc on 3/4

PGM Video+ on screen display

+Emb Aud on 1/2

+Aud Desc or Mixed 'Emb Aud and Aud Desc' on 3/4

Pin Number	Function
1	Not used
2	Not used
3	Not used
4	Not used
5	AES 1a AD monitor mix+
6	AES 1a AD monitor mix-
7	AES 1b AD monitor mix+
8	AES 1b AD monitor mix-
9	AES 2a AD reclock output+
10	AES 2a AD reclock output-
11	AES 2b AD reclock output+
12	AES 2b AD reclock output-
13	Not used
14	Not used
15	GND

Figure 7 AD-2E rear connections

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BNC connections are not used

Pin Number	Function
1	Relay 1 contact1. AD alarm.
2	Relay 1 contact2. AD alarm. Contact 1&2 make when an AD error condition occurs.
3	Relay 2 contact1. AD alarm accepted.
4	Relay 2 contact2. AD alarm accepted. Contact 1&2 make when the error condition is cleared by the input GPI. This will clear when there are no more errors on the AD feed.
13	GPI input. Accept current alarm. The user shorts this to ground to clear the AD alarm tally relay output.
25	GND

Figure 8 GPI and alarm connection details

2.4 Connecting Panels to the AD-2/AD-2E

The AD-2/AD-2E may be operated using a FP-9 Flexipanel locally mounted. For a more operational environment the AD-2/AD-2E may be supplied with a desk mounting FP-10 or remotely sited FP-9. For detailed information on connecting remote panels refer to the section “Connection of Remote Panels to a flexiBox” in the geNETics Hardware Installation Guide.

Below is shown a typical system consisting of an AD-2/AD-2E in a flexiBox controlled by a remotely mounted FP-9.

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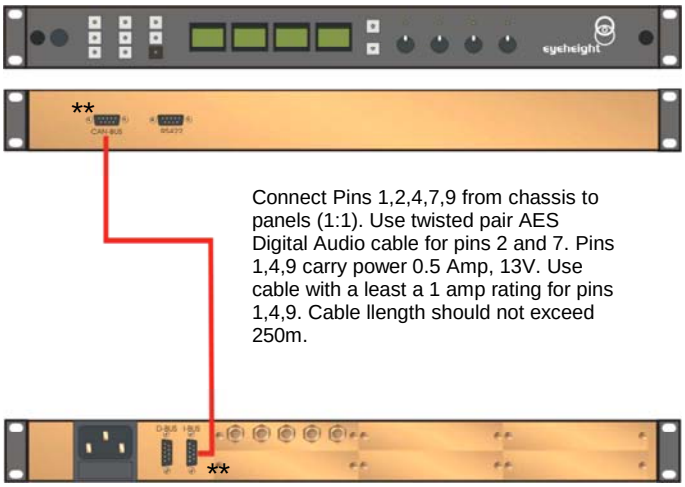
**
Connect Pins 1,2,4,7,9 from chassis to panels (1:1). Use twisted pair AES Digital Audio cable for pins 2 and 7. Pins 1,4,9 carry power 0.5 Amp, 13V. Use cable with a least a 1 amp rating for pins 1,4,9. Cable llength should not exceed 250m.
**

I-Bus pins 2 & 7

** The I-BUS Network requires terminating with 100 Ohms at each extreme end of the network. Ensure that this is done either by an external 100 ohm resistor OR ONE Panel/Product at each end has the termination set. See the "Genetics User Guide" Under the sections "Flexipanel Power/I-BUS Jumpers".For the 4RU Panels see “4RU Panel (FP-10) Jumpers for I-BUS” and “4RU Panel (VP-10, SW-10, AP-10) Jumpers for I-BUS” . Alternatively The termination can be set on a Product (ie the AD-2/AD-2E module). Information about this is given in this manual.

Figure 9 I-Bus connection from chassis to panel

N.B. From 1/10/02 Eyeheight introduced a change in the flexiBox Chassis. Most versions now have two 9 way connectors on the rear labelled “I-Bus” and “D-Bus”. The “I-Bus” connector is the same as the previously labelled “Can-B” connector. Although a maxiBox is shown in this diagram the same arrangement applies for a flexiBox chassis.

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3 Operation

3.1 Manual control of the AD-2/AD-2E

Manual Control of the AD-2/AD-2E is done using one or more of the following control surfaces:

- The 1RU FP-9 flexiPanel.
- The FP10 Desk mounting panel

The FP-9 and the FP-10 have identical manual control systems. (The FP-10 is simply a desktop version of the FP-9).

The AD-2/AD-2E is, as are all genetics modules, controlled using a set of MENUS. Each of these menus contains up to 3 parameters that are adjusted using the rotary digipots. The Menus define all of the adjustable operational parameters in the AD-2/AD-2E. Pressing the rotary digipots brings the parameter to its default value. Device selection is done using the device select switches which, when pressed, will offer the name of the device in the LCD Window. Modules can be acquired and then de-acquired using the set-up switch. For a full description of the operation philosophy of the geNETics system refer to the "geNETics User Guide" (section "Operation of the flexiPanel")

A full list of the Menus and their functions are given in section 3 of this chapter.

3.2 Automation Control of the AD-2/AD-2E

Automation of the geNETics products is achieved via an RS422 port.** This port is marked RS422 on the rear of a flexiBox. For the port to work a flexiPanel MUST be connected locally on the front of the flexiBox.

Automation control of the AD-2/AD-2E can be done using two protocol methods:

- geNETics Automation Protocol.
- PresTX Automation Protocol.

Genetics protocol is described in detail in the "GeNETics User Guide" section titled "Automation Protocol on the geNETics Platform". The menu list in section 3 of this chapter contains the data information for the protocol.

PresTX Automation Protocol is used only for the PresTX Presentation Mixer and channel branding system. In this case an AU-2 Automation card is also required. Refer to the PresTX Product manual

**On most flexiBoxes later than 1/10/02 the RS422 port has been replaced by a "D-Bus" Port. The D-Bus port is for High Speed data transfer and is not used for serial control. In order to achieve serial control of any products on an I-Bus network Eyeheight Ltd have developed a RS232→I-bus converter "dongle", (DG-9) which enables greater flexibility of products on the I-Bus network whilst using the same protocols as the RS422 port. Please refer to the "User guide for the DG-9 eyeheight dongle and set-up software.

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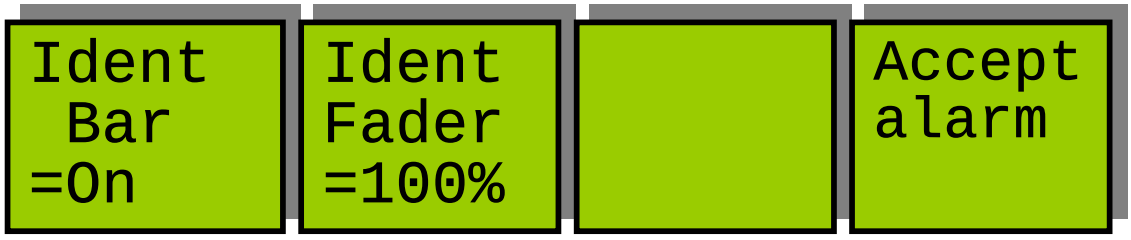
3.3 Operational Menus for the AD-2/AD-2E

Menus 00-03 Top Level Menus

Menu Num.	Heading	Automation	Function
00	User Name	none	This is the user-programmed name for this unit. (see genetics user guide for information as to how to program names or aliases)
01	Software version	none	This displays the current software version.
02	Monitoring output gain	0→FF 0=0dB FF=-77dB	This adjusts the gain (volume) of the Programme+AD mix AES monitoring output.
03	NEXT	none	Prompts the user to press the button marked NEXT for further menu options.

Menus 04-07, ident bar and audio alarm accept.

(Press NEXT/PREV to navigate)



Menu Num.	Heading	Automation	Function
4	Ident Bar	Off,On Default is On	Pressing this will turn on or off the Ident Bar.
5	Ident Fader	0-100% Default is 100%	The fade level of the Ident bar overlaid on to the video image.
6	Not used		
7	Accept alarm	none	Pressing this accepts the current alarm.

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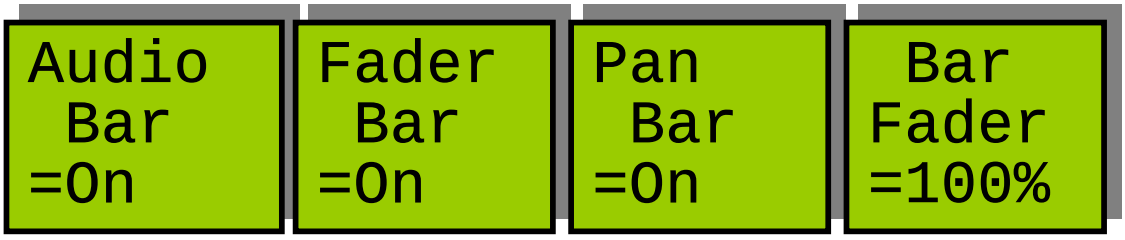
Menus 08-11 Screen display select.

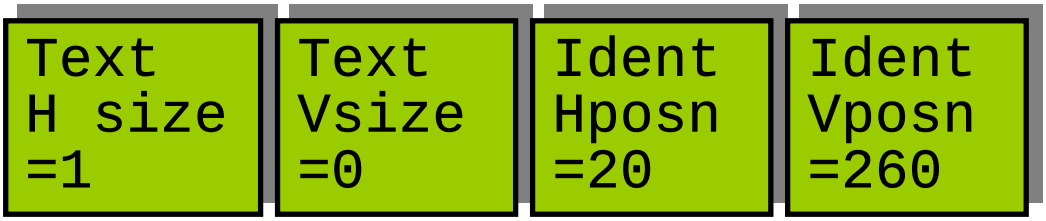
(Press NEXT/PREV to navigate)



Menu Num.	Heading	Automation	Function
8	Audio Bar	0=Off 1=On Default is On	Pressing this will turn on or off the Audio Bar.
9	Fader Bar	0=Off 1=On Default is On	Pressing this will turn on or off the Fader Bar.
10	Pan Bar	0=Off 1=On Default is On	Pressing this will turn on or off the Pan Bar.
11	Bar Fader	0=0ff 296d=Full on	The fade level of the Audio, Fader and Pan bar overlaid on to the video image.

Menus 12-15 Ident bar size and position

(Press NEXT/PREV to navigate)



Menu Num.	Heading	Automation	Function
12	Text H size	0-1, Default is 1	This sets the horizontal size of the text.
13	Text V size	0-1, Default is 0	This sets the vertical size of the text.
14	Ident H posn	0-999 Default is 20	This sets the horizontal position of the Ident bar on the video image.
15	Ident V posn	0-999 Default is 260	This sets the vertical position of the Ident bar on the video image.

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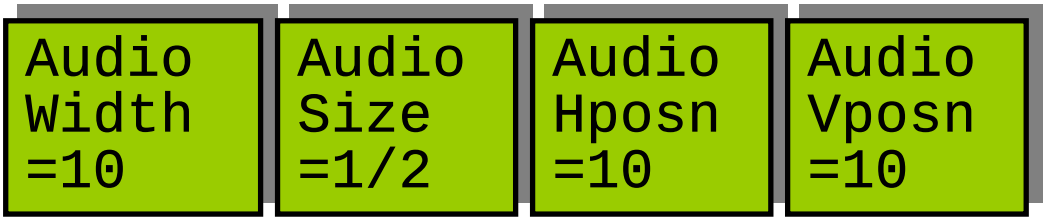
Menus 16-19 Audio bar graph size and position

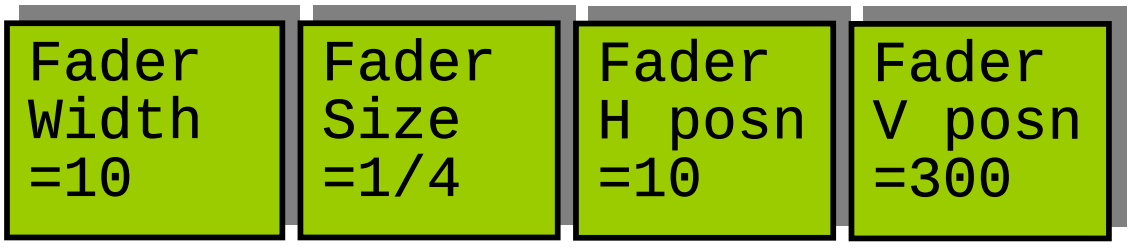
(Press NEXT/PREV to navigate)



Menu Num.	Heading	Automation	Function
16	Audio Width	2-62 Default is 10	The width of the Audio bar.
17	Audio size	0=1/4 1=half 2=full Default is half	The length of the Audio bar. The following options are available ¼, ½ and Full.
18	Audio H posn	0-999 Default is 10	This sets the horizontal position of the Audio bar on the video image.
19	Audio V posn	0-999 Default is 10	This sets the vertical position of the Audio bar on the video image.

Menus 20-23 Fader bar graph size and position

(Press NEXT/PREV to navigate)



Menu Num.	Heading	Automation	Function
20	Fader Width	2-62 Default is 10	The width of the Fader bar.
21	Fader size	0=1/4 1=half 2=full Default is 1/4	The length of the Fader bar. The following options are available ¼, ½ and Full.
22	Fader H posn	0-999 Default is 10	This sets the horizontal position of the Fader bar on the video image.
23	Fader V posn	0-999 Default is 300	This sets the vertical position of the Fader bar on the video image.

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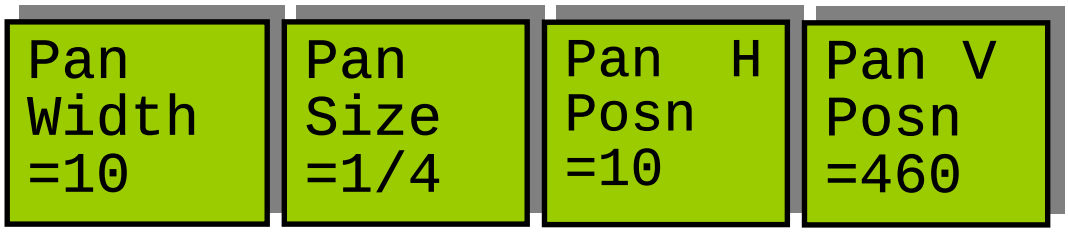
Menus 24-27 Pan bar graph size and position

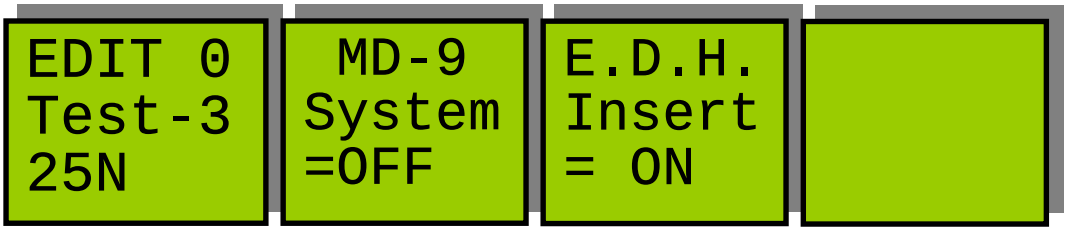
(Press NEXT/PREV to navigate)



Menu Num.	Heading	Automation	Function
24	Pan Width	2-62 Default is 10	The width of the Pan bar.
25	Pan size	0=1/4 1=half 2=full Default is 1/4	The length of the Pan bar. The following options are available ¼, ½ and Full.
26	Pan H posn	0-999 Default is 10	This sets the horizontal position of the Fader bar on the video image.
27	Pan V posn	0-999 Default is 460	This sets the vertical position of the Fader bar on the video image.

Menus 28-31 Edit Ident bar information

(Press NEXT/PREV to navigate)



Menu Num.	Heading	Automation	Function
28	EDIT	none	Pressing the return key switches the system into an editing mode. The memory to be edited is displayed on the top line this can be adjusted by pressing the display button or by turning the associated knob. The first 6 characters form the text of the message, the next two digits define the foreground and background colours. The last digit defines whether the text is flashing (F) or normal (N), the default is normal so the 'N' may be omitted. The colours are defined as : 0=white, 1=cyan, 2=yellow, 3=green,

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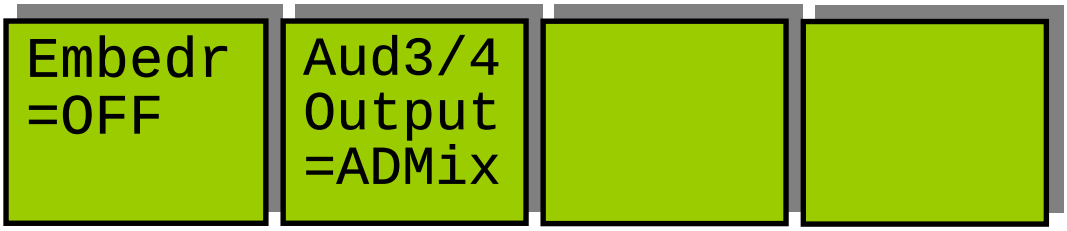
			4=magenta, 5=blue, 6=red and 7=black. Defining either colour to be red, 6, will cause an alarm to be generated when that A.F.D. message or error message occurs. This does not apply to the channel ID. The memory locations are defined as : 0=ID, 1=OK, 2=Absent, 3=Swapped, 4=Inverted, 5=Swapped and Inverted, 6=CRC error, 7=Swapped and CRC error, 8=Inverted and CRC errorand 9=Swapped, Inverted and CRC error. When editing of a message is complete pressing return will revert the system into normal mode.
29	Master Display System	1=ON 2=OFF	If this system has a remote master display system (Eyeheight product code MD-9) then this must be set to ON. Otherwise it must be OFF.
30			SPARE
31			SPARE

Menus 32-35 Embedder Controls (AD-2E only)

(Press NEXT/PREV to navigate)



Menu Num.	Heading	Automation	Function
32	Embedder On/Off	0=OFF 1=ON 2=NotFit	Controls embedder for output video (Program audio in groups 1/2 and audio description or 'mixed of program and audio description' in groups 3/4) Not fitted in AD-2 (AD-2E only).
33	Re-Embed AD into groups 3/4	0=ADMix 1=AuDes 2=NotFit	Individual control for embedding 'audio description' or 'mixed of program and audio description' in groups 3/4 of output video. Not fitted in AD-2 (AD-2E only).
34			SPARE

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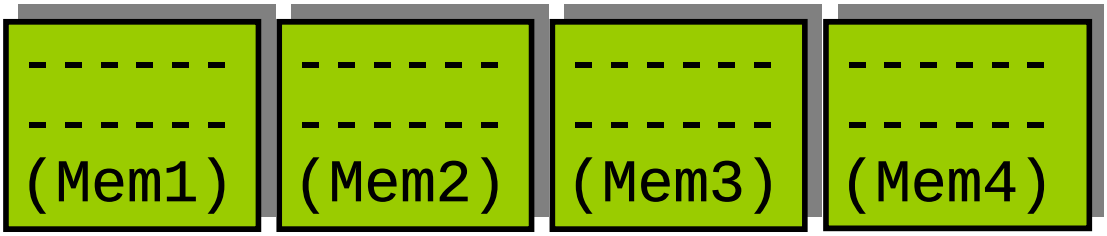
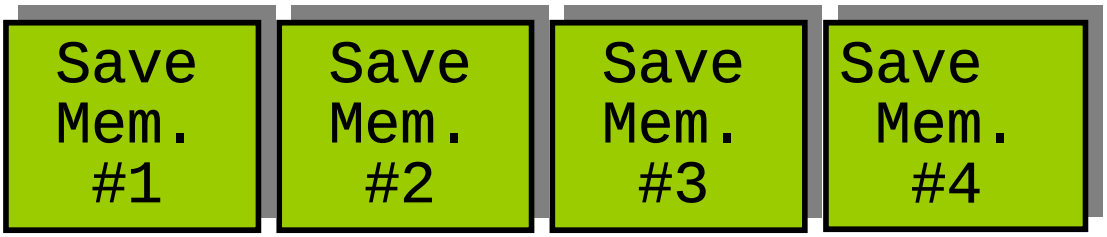
35			SPARE

Menu 36-39: Memory Recall (Press NEXT/PREV to navigate)



Menu Num.	Heading	Automation	Function
36	MEM1	1 recalls memory	Recalls configuration memory 1
37	MEM 2	1 recalls memory	Recalls configuration memory 2
38	MEM 3	1 recalls memory	Recalls configuration memory 3
39	MEM 4	1 recalls memory	Recalls configuration memory 3

Menu 40-43: Memory Save (Press NEXT/PREV to navigate)



Menu Num.	Heading	Automation	Function
40	SAVE MEM1	1 saves configuration	Saves current configuration as memory 1
41	SAVE MEM2	1 saves configuration	Saves current configuration as memory 2
42	SAVE MEM3	1 saves configuration	Saves current configuration as memory 3
43	SAVE MEM4	1 saves configuration	Saves current configuration as memory 4

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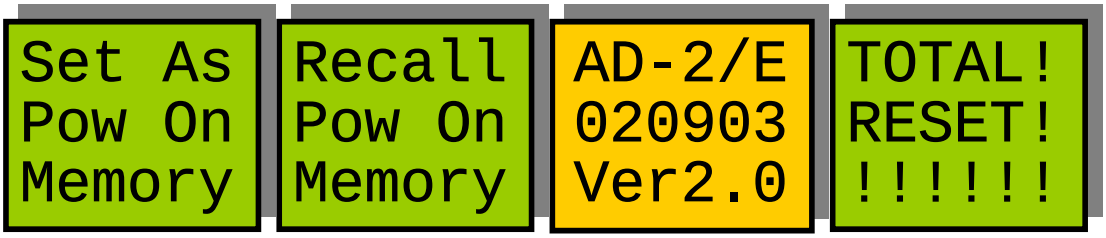
Menu 44-47: Power On Memory (Press PREV to navigate)



Menu Num.	Heading	Automation	Function
44	Save Power On Memory	1 to save memory	Saves current configuration as Power On memory.
45	Recall Power On Memory	1 to recall memory	Recalls the Power On memory configuration.
46	"Total Reset ".	1 to cause Total Reset	This puts all current and power on default settings to the factory default
47	Software version		This displays the current software version.

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4 Technical Appendix

4.1 Technical Specification for the AD-2

AES audio Inputs	2 off AES inputs, transformer coupled.
Type of Inputs	AES-2 48KHz
AES audio Outputs	4 AES outputs for monitoring and AD reclocking.
Type Of Outputs	AES-2 48KHz
Video Input	1 off SDI.
Type of Inputs	SDI 270Mbit
Video Outputs	1 off SDI.
Type Of Outputs	SDI 270Mbit for monitoring on screen display
SDI Output Jitter	The system will add less than 0.2UI to the input Jitter.
Current Consumption	<800mA at +5V

4.2 Technical Specification for the AD-2E

AES audio Inputs	None
AES audio Outputs	4 AES outputs for monitoring and AD reclocking.
Type Of Outputs	AES-2 48KHz
Video Input	1 off SDI with embedded audio pgm on 1-2 and audio description data on 3-4.
Type of Inputs	SDI 270Mbit with embedded audio data
Video Outputs	1 off SDI with embedded audio data
Type Of Outputs	SDI 270Mbit for monitoring on screen display
SDI Output Jitter	The system will add less than 0.2UI to the input Jitter.
Current Consumption	<800mA at +5V

4.3 Technical Specification for the GPI/Tally connector

GPI inputs	1 off, short to ground to activate for alarm accept
Relay closure outputs	2 off isolated relay closure outputs up to 1 Amp current flow. One for Alarm and one for alarm accept.
Current Consumption	<300mA at +5V

4.4 Jumpering the I-BUS (CAN-BUS) Termination

The I-BUS Network is the "control system" under which all Products and Panels are networked together. Under certain circumstances it is necessary to terminate the network. This can be done on a Panel or a "Product". To terminate this product, locate J6 on the AD-2 Processor Card supplied which is between U1 (The large square "chip") and the Edge connector. (This is on the half of the card

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labelled "CHP-100 Spartan2 Processor"). Jumper this with a 2mm link.

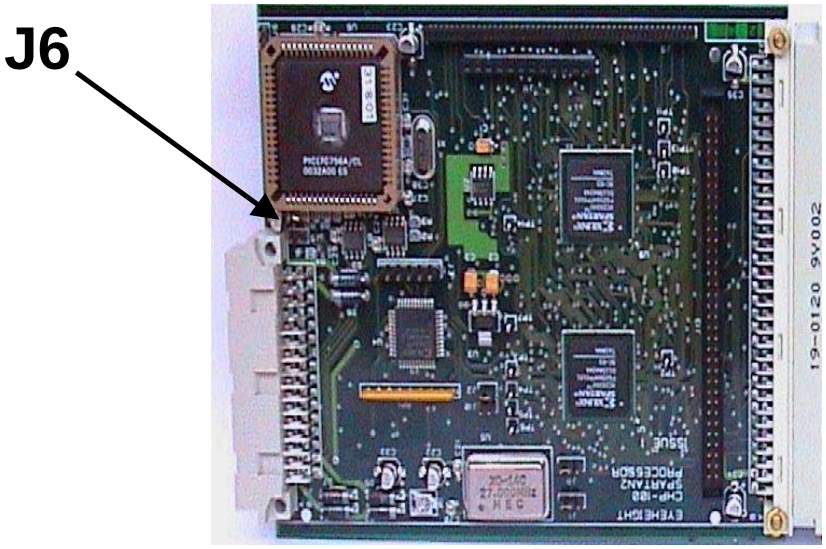

Figure 10 Location Of I-Bus Termination Link

4.5 CHP-100 SDI-TC-GPI Card

4.5.1 Jumper Links on the Timecode and GPI I/O card

The AES output has a number of jumper links, which effect the formatting of the AES, output data.

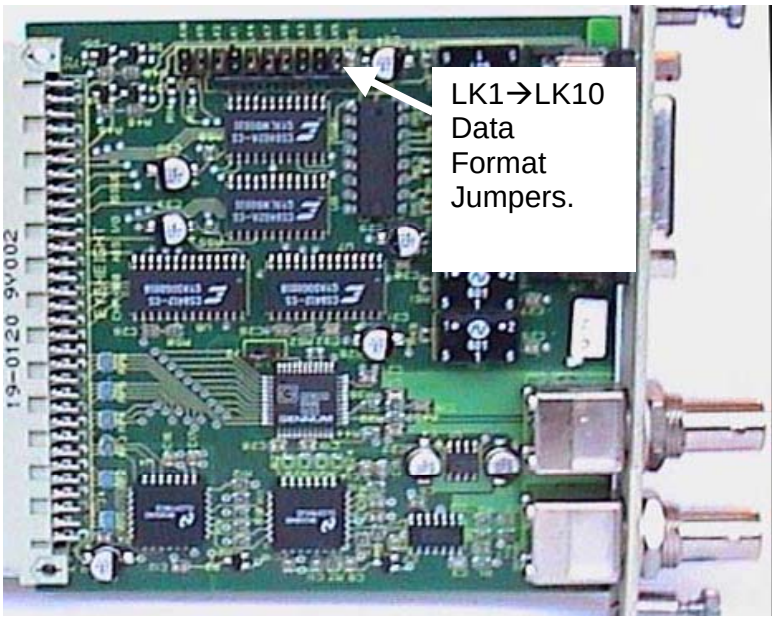

Figure 11 jumpers on the AD-2/AD-2E card

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Link No.	Function of LK1→LK10 Links	Standard
10	Emphasis1, combined with Emphasis0 sets the Equalisation data on the channel status bits	No Link
9	Emphasis0, combined with Emphasis1 sets the Equalisation data on the channel status bits	Link
2	Stereo mode set in Channel Status bits. (Link to set)	Link
1	User Bit set in Channel Status bits. (Link to clear)	Link
4	Diagnostic MUST BE LINKED!!	Link
7	Validity Bit set in Channel Status bits. (Link to clear)	No Link
8	Sampling Freq1. combined with Sampling Freq0 sets the Sampling Frequency data on the channel status bits.	No Link
3	Non-Audio Bit set in Channel Status bits. (Link to set)	No Link
6	Professional Mode Bit set in Channel Status bits. (Link to set)	Link
5	Sampling Freq0. combined with Sampling Freq1 sets the Sampling Frequency data on the channel status bits.	Link

Emphasis0	Emphasis1	Function
No Link	No Link	Undefined Emphasis
Link	No Link	No Emphasis
No Link	Link	50/15uS Emphasis
Link	Link	CCITT J17 Emphasis

Sampling Freq0	Sampling Freq1	Function
No Link	No Link	32.0K Sampling
Link	No Link	48.0K Sampling
No Link	Link	44.1K Sampling
Link	Link	Sampling Freq Not Indicated.

Figure 12 Jumper links for the AES output configuration

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